UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/435,458	02/15/2000	Anna Malgorzata Celler	80142US	5246

			EXAMINER

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EXAMINER
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ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-40_ is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _1-8,10-23 and 25-40_ is/are rejected.
7) ☒ Claim(s) _9 and 24_ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _05 November 1999_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. _____.
    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
       application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1.   Claims 1-8, 10-23 and 25-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Celler ("An EM-algorithm for dynamic SPECT tomography", March 1997).

a.   Referring to Claim 1, Celler discloses receiving data representing successive tomography scan images of said object (page 1, paragraph 2, projection image of patient's organs, such as kidney or heart mentioned in paragraph 3); performing calculation by imposing an inequality constraint (page 4, equation 4) to determine dynamic data values (x_{ik} in equation 1 are the claimed dynamic values) from said data (data is the projection image data), each of said dynamic data values representing a physical property (the physical property is the geometry property mention at page 4, paragraph 1) of said object at a respective corresponding one of a plurality of voxels of said object at a respective corresponding time (page 3, paragraph 1); and producing a representation of said dynamic data values, representing said physical property at said voxels at said times (see equation 2 at page 4).

b.   Referring to Claim 2, Celler discloses wherein performing said calculations includes minimizing a figure of merit function subject to said inequality constraint (page 10, section 7).

c.   Referring to Claim 3, Celler discloses one of the linear inequality constraint at page 3, equation 4, and the merit function is shown in section 7 at page 10, $\|Cx - y\|$.

d.   Referring to Claim 4, Celler discloses wherein receiving data includes receiving data representing successive images detected at a single photoemission computed tomography image device (page 2, paragraph 1).

e.   Referring to Claim 5, Celler discloses receiving a plurality of sets of values representing measurements of said property (geometry measurements, page 3, last paragraph, the values are coefficients c_{ijk}) across an object at respective measurement times, each set being associated with a respective measurement time; producing a plurality of sets of values representing said property at a plurality of locations throughout said object at said respective measurement times (page 3, and page 4, first paragraph), by minimizing a figure of merit function relating said values representing said measurements with said values representing said property at said plurality of locations, with a shape constraint imposed on said values representing said property at said plurality of locations (section 7, page 10, and the constraint is an inequality constraints).

f.   Referring to Claim 6, Celler discloses wherein minimizing said figure of merit function further comprises solving for numerical values describing said property for each of said locations throughout said object, said numerical values being constrained by said shape constraint (see section 8, page 13).

g.   Referring to claim 7, Celler disclose wherein minimizing said figure of merit function further comprises solving for linear basis functions describing said property for

each of said locations through said object, said linear basis functions being constrained by said shape constraint (section 8, page 13).

h.   Referring to Claim 8, Celler discloses wherein minimizing said figure of merit function further comprises minimizing a sum of squares of a difference between a product of a linear operator and said values representing said property, and said values representing said measurements (section 7, page 13, first equation).

i.   Referring to Claim 10, Celler discloses wherein minimizing a figure of merit function includes executing a math program on said values representing said measurements, said shape constraint being pre-specified to said math program (it is understood in the art that a SPECT machine contains processing power to execute programs such as Celler's EM-algorithm, which is a math program).

j.   Referring to Claim 11, Celler discloses producing a graphical representation of said object, for controlling a display device (section 6, page 8, Celler teaches producing projection information, which is graphical representation of said object for controlling a display device, which is incorporated in a SPECT system. In addition, Celler at page 1, paragraph 3, teaches a dynamic SPECT reconstruction might be presented as a movie rather than a static image, which implies the system includes a display. Note the metric mentioned at page 8, line 10 is the claimed "graphical representation").

k.   Referring to Claim 12, Celler discloses producing a time varying graphical representation of said object to present a change of said property over time (Celler at page 3, paragraph 2, teaches the system displays the object over a period of 20 minutes, and the changes are recorded and display as a movie).

l.   Referring to Claim 13, Celler discloses transmitting said graphical representation to a display device for displaying a representation of said property (to display the movie, the graphical representation must be transmitted to a display device).

m.   Referring to Claim 14, Celler discloses displaying said representation of said property (the metric representation is projected).

n.   Referring to Claim 15, Celler discloses producing successive images representing said property at successive instants in time, in response to said representation of said property (Celler teaches the SPECT reconstruction is represented as a movie, which is a series of successive images, in response to the geometry representation of said property).

o.   Referring to Claim 16, Celler discloses producing said successive images to depict a three dimensional representation of said property in said object which varies according to changes in said property over time (page 4, paragraph 1 in section 3).

p.   Referring to Claim 17, Celler discloses producing said sets of values representing measurements of said property across said object at respective measurement times (page 3, and page 4, first paragraph).

q.   Referring to Claim 18, Celler discloses wherein producing comprises measuring radioactivity across said object (page 3, paragraph 3).

r.   Referring to Claim 19, Celler discloses wherein measuring radioactivity includes operating a Single Photon Emission Computed Tomography (SPECT) imaging device (page 1, paragraph 1).

s.   Referring to Claim 20, Celler discloses a signal representing said plurality of sets of values representing said property at a plurality of locations through said object (as

mentioned above SPECT contains processing power which inherently produces an electronic signal to represent the plurality of sets of values representing said property at a plurality of locations through said object as mentioned in Claim 5 above).

t.   With regard to Claim 21, see explanation in Claim 5, as noted here again the SPECT machine inherently contains the components of a receiver and a processor circuit to perform the functions disclosed in Claim 5.

u.   With regard to Claim 22, see explanation in Claim 7.

v.   With regard to Claim 23, see explanation in Claim 8.

w.   With regard to Claim 25, see explanation in Claim 11.

x.   With regard to Claim 26, see explanation in Claim 12.

y.   With regard to Claim 27, see explanation in Claim 13.

z.   With regard to Claim 28, see explanation in Claim 13.

aa.   Referring to Claim 29, Celler discloses comprising a display for displaying said representation of said property (Celler discloses displaying reconstruction data as a movie, which must be display in a display device).

bb.   With regard to Claim 30, see explanation in Claim 15.

cc.   With regard to Claim 31, see explanation in Claim 16.

dd.   With regard to Claim 32, see explanation in Claim 17.

ee.   With regard to Claim 33, see explanation in Claim 18.

ff.   With regard to Claim 34, see explanation in Claim 19.

gg.   With regard to Claim 35, see explanation in Claim 19.

hh.   With regard to Claim 36, see explanation in Claim 21.

ii.   With regard to Claim 37, only difference between Claim 5 and Claim 37 is Claim

37 calls for additional limitation of "a computer readable medium for providing computer

readable instructions", Celler teaches the SPECT machine inherently contains a processor

to carry out program instruction recorded on a computer readable medium, and the

program instruction is in accordance with the steps in Claim 5.

jj.   With regard to Claim 38, see explanation in Claim 37, and Celler's SPECT

machine contains "a computer data signal embodied in a carrier wave".

kk.   With regard to Claim 39, see explanation in Claim 5.

ll.   With regard to Claim 40, see explanation in Claim 21, and the display is

explained in Claim 29.

Allowable Subject Matter

2.   Claims 9 and 24 are objected to as being dependent upon a rejected base claim, but would

be allowable if rewritten in independent form including all of the limitations of the base claim

and any intervening claims.

Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

      a. Gullberg et al, U.S. Patent No. 5,565,684, see figures 2 and 3 for standard SPECT

        component circuits.

      b. Moeckel, U.S. Patent No. 4,802,147, see column 16, lines 23-39.

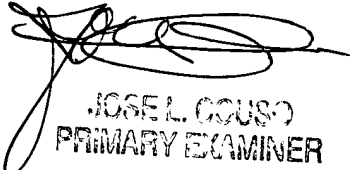   c. Ning, U.S. Patent No. 6,075,836, see columns 10, lines 23-45.

4.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y Lu whose telephone number is (703) 306-4057. The examiner can normally be reached on 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Y. Lu